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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/594,556	06/15/2000	Naoya Wada	193130US2X	8640
22850	7590	10/18/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			BELLO, AGUSTIN	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

✓

<b>Office Action Summary</b>	<b>Application No.</b> 09/594,556	<b>Applicant(s)</b> WADA ET AL.	
	<b>Examiner</b> Agustin Bello	<b>Art Unit</b> 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 9-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/28/05 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki in view of U.S. patent No. 5,729,548 to Holender and Gutleber (U.S. Patent No. 4,301,530).

Regarding claim 1, Araki discloses a photonic network packet routing method (Fig. 1 or Fig. 20) comprising a step of discriminating (e.g. extracting) the encoded address information of the IP packet (Col. 12, lines 33-36) by optical correlation processing (e.g. via 105, 107, 109 and 110 of Fig. 2 and via 503 and 525 of Fig. 11), a step of switching to an output path (e.g. via combination of 103, 104 and 100 of Fig. 1) for the IP packet based on a result of the discrimination (e.g. via 1003 and 1004 of Fig. 2 and Col. 12, lines 37-50), and a step of outputting the IP packet labeled with prescribed address information (e.g. Destination 1 of input unit of Fig. 25 and 2003 of Fig. 24 and Col. 11, lines 37-44) on the output path selected by the

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switching step (Col. 10, lines 39-47 and Col. 11, lines 11-21). Though he discloses a step of encoding address information (e.g. 950 of Fig. 30) using light attributes (1001 of Fig. 30), he fails to disclose a step of optically encoding destination address information attached to an IP packet. Holender discloses an optical encoder (optically encoding) (916 of Fig. 9) for encoding optical pattern that corresponds to the destination's address (destination address information) (Col. 2, lines 24-52 and Col. 15, lines 39-48) attached with packet payload (913 of Fig. 9) and packet address (912 of Fig. 9). Accordingly, one of ordinary skill in the art would have been motivated to incorporate an optical encoder for optically encoding address information to increase the speed of telecommunications switches by adapting optical encoding-decoding techniques to telecommunications applications. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the optical packet switching system of Araki by substituting the steps of encoding address information with steps of encoding address information using optical encoders as taught by Holender to obtain the invention as claimed in claim 1.

Araki further differs from the claimed invention in that Araki fails to specifically teach bi-polar coding and discriminating the optical IP packet by estimating peak values of optical time correlations of the encoded destination address. However, this concept is well known in the art of communication. Gutleber teaches a bi-polar coding scheme (Figure 3) as well as estimation of peak values of optical time correlations of the encoded destination address (Figure 4). One skilled in the art would have been motivated to employ the bipolar scheme of Gutleber in order to allow random access to be accomplished with total non-interference between users (abstract of Gutleber). Therefore, it would have been obvious to one skilled in the art at the time the

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invention was made to employ a bi-polar coding scheme (Figure 3) as well as estimation of peak values of optical time correlations of the encoded destination address (Figure 4) as taught by Gutleber.

4. Regarding claim 4, Araki in view of Holender and Gutleber discloses discrimination of the optically encoded address information (e.g. via 916 of Fig. 9, Holender) is conducted by sending the IP pack, et (e.g. 1001 of Fig. 11, Araki labeled with address information (e.g. via 1003 or 525 or 1002 of Fig. 11, Araki or via 912 of Fig. 9, Holender) onto a number of arms equal to the number of address (e.g. one address is extracted from the packet which is sent to one arm entries (outputs of 101-1 to 101-4 of Fig. 11 are sent via 100 to corresponding output unit 502-1 to 502-4 of Fig. 11, Araki and simultaneously conducting optical correlation processing (e.g. via 105, 107, 109 and 110 of Fig. 2 and via 503 and 525 of Fig. 11, Araki) on all arms in parallel. Regarding claim 7, Araki in view of Holender discloses dividing an IP packet having encoded address information (e.g. 1001 of Fig. 2 or Fig. 6, Araki) in two (e.g. one part directs to 107 and the other to 109 of Fig. 2, Araki, a step of conducting optical correlation processing (e.g. via 105, 107, 109 and 110 of Fig. 2 and via 503 and 525 of Fig. 11, Araki) to discriminate (e.g. decode) address information from an optical code in one IP packet containing address information (e.g. via 1003 of Fig. 2 or 116 of Fig. 4 and Col. 13, lines 14-18, Araki) between the two divided IP packets, a step of selecting an output path (e.g. via selector, 108 of Fig. 2 or 121, 1008 and 1009 of Fig. 4, Araki based on a result of the discrimination (e.g. 1005 of Fig. 2 and Col. 12, lines 40-46 or e.g. base on contention resolution, Col. 13, lines 19-44, Araki), and a step of outputting the other divided IP packet on the selected output path (e.g. 1002 of Fig.

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2 switches via 100 of Fig. 1 to the output port which corresponds to its address or via 1008-1 to output unit 1 while 1005-1 goes to input unit 1, Fig. 4, Araki).

5. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki in view of Holender and Gutleber as applied to claim 1, and further in view of U.S. Patent No.

6,473,214 B1 to Roberts et al (hereinafter Roberts).

Regarding claim 2, Araki in view of Holender and Gutleber discloses all limitations as discussed above, further discloses the optical encoding (e.g. via 916 of Fig. 9, Holender) is conducted by dividing an optical pulse output (e.g. via 873 of Fig. 22, Araki) by a pulse source (e.g. via 871 of Fig. 22 and Col. 5, lines 50-53, Araki) into N number of chip pulses (Col. 5, lines 61-67, Araki) and recombining (e.g. via 875 of Fig. 22, Araki) the divided optical chip pulses. He fails to disclose an optical encoding having a prescribed delay time therebetween, imparting the individual chip pulses with phase shifts of "0" or "a" relative to a light carrier phase of the chip pulses. Roberts discloses an optical encoder (10 of Fig. 1) having a prescribed delay time therebetween (e.g. via 58 of Fig. 5 and Col. 12, lines 57-60), imparting the individual chip pulses with phase shifts of "0" or "a" (e.g. by producing zero or +/-  $\pi$  phase difference) relative to the signals being combined (light carrier phase of the chip pulses) (Col. 9, lines 5-14). Accordingly, one of ordinary skill in the art would have been motivated to incorporate the above delays and phase shift for producing maximum constructive and destructive interference, which could facilitate the optical signal transmission of high speed signals over long distances, with relatively low technical complexity and cost (Col. 2, lines 66-67 & Col. 3, lines 1-3). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the optical packet switching

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system of Araki in view of Holender by prescribing a delay time and imparting the individual chip pulse with phase shifts of '0" or "a" in the process of optical encoding because Roberts suggests that this would produce maximum constructive and destructive interference.

Regarding claim 5, Araki in view of Holender, Gutleber, and Roberts discloses discrimination of the encoded address information (e.g. via 916 of Fig. 9, Holender) is conducted by subjecting optical chip pulses to matched filtering (e.g. via. 20 or 24 of Fig. 1, Roberts), effecting threshold processing on a center peak value (e.g. by having passband centered on the desired frequency or any desired frequency range, Col. 9, lines 51-60, Roberts) of a generated autocorrelation function (Fig. 6, Roberts), and optically regenerating the obtained "0" or "1." (e.g. maximum optical signal amplitude represents a "0" bit and a minimum optical signal amplitude represents a "1" bit, Col. 9, lines 61-67, Roberts).

6. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki in view of Holender and Gutleber as applied to claim 1, and further in view of U.S. Patent No. 6,160,656 to Mossberg et al (hereinafter Mossberg).

Regarding claim 6, Araki discloses a packet router comprising a step of optical decoding but fails to disclose that it comprises of a step of subjecting an output of an optical decoder to time gate processing, when subjecting a center peak value of a correlation function to threshold processing, thereby cutting off a center part and eliminating side-lobes of correlation waveform and a step of conducting threshold processing. Mossberg teaches the output of grating (optical decoder) (21 of Fig. 2a & Col. 4, lines 11-14) is subject to be detected by time-integrating linear

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or nonlinear device (time gate processing) (24a and 24b of Fig. 2a or 29a and 29b of Fig. 2b and Col. 4, lines 14-17), when subjecting a center peak value of a correlation function (e.g. 23 of Fig. 2a) to threshold processing (e.g. via threshold detection, Col. 2, lines 5-13 or via electronic thresholding device Col. 3, lines 30-34 or via by emitting a signal that is in the form of a short auto-correlation pulse, Col. 4, lines 7-45), thereby cutting off a center part and eliminating side-lobes of correlation waveform (e.g. 28 of Fig. 2b) and a step of conducting threshold processing (e.g. by setting a threshold level to discriminate between optical signals of similar energy but with and without high power subsignals, Col. 4, lines 43-64). Accordingly, one of ordinary skill in the art would have been motivated to subject the output of grating in the form of an optical decoder to time gate and threshold processing to provide a means of processing output channel signals so as to provide a robust means of differentiating between output signals of similar energy but different temporal waveform without the need of time-solving the waveform of the output signals (Col. 1, lines 60-65). Therefore, it would have been obvious to a person of ordinary skill in the art to have modified the optical packet switching system of Araki in view of Holender and Gutleber by substituting the grating with an optical decoder which subjects its output to time gate and threshold processing to obtain the invention as specified in claim 6.

Regarding claim 8, Araki in view of Holender, Gutleber, and Mossberg discloses the address information (e.g. via 912 and 916 of Fig. 9, Holender) is discriminated by sending the IP packet (e.g. 1001 of Fig. 1 1, Araki) onto a number of arms equal to the number of output paths (e.g. one address is extracted from the packet which is sent to one arm) entries (e.g. outputs of 101-1 to 101-4 of Fig. 1 1 are sent via 100 to corresponding output unit 502-1 to 502-4 of Fig. 1



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1, Araki) and simultaneously conducting optical correlation processing (e.g. via 105, 107, 109 and 110 of Fig. 2 and via 503 and 525 of Fig. 1 1, Araki) on all arms in parallel.

***Response to Arguments***

7. Applicant's arguments with respect to claim 6/28/05 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB

  
**AGUSTIN BELLO**  
**PRIMARY EXAMINER**